

The Monthly Electronic Newsletter of Zoological Survey of India



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### From the Director's Desk

The month of June was very auspicious for the Zoological Survey of India. The Headquarters as well as the Regional Centres of the Survey celebrated the World Environment Day on the 5<sup>th</sup> June 2009 with eminent personalities gracing the occasion. Further, the Hon'ble Minister of Environment & Forests, Govt. of India, New Delhi, Sri. Jairam Ramesh paid a visit to ZSI, Kolkata and all the scientists/ officers and staff of the organization extended a warm welcome to the dignitary. The Hon'ble Minister was apprised of the various scientific activities of the institution. The Minister's maiden visit to the institution was a grandiose moment boosting the morale of the staff. The Minister during the occasion released four books published by the department. Yet another significant achievement was the release of 'Animal Discoveries 2008' (a publication by the Survey dealing with the new species and new records discovered from the country during 2008), by the Hon'ble President of India Smt. Pratibha Devisingh Patil on 5th June, at New Delhi. Besides, four scientists of ZSI were selected to participate in the 'IUCN Eastern Himalayas Freshwater Biodiversity Assessment Training Workshop' scheduled to be held at Kathmandu, Nepal.



Dr. Ramakrishna

ANIMAL OF THE **MONTH** 



The Pink-headed Duck

### Check-list of fauna of India:

- 1. Odonata (Insecta)
- 2. Pteromalidae (Hymenoptera: Insecta)
- 3. Acanthocephala

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- 1. Rotifera
- 2. Freshwater Medusa
- 3. Orange Spotted Grouper

# Headquarters, Kolkata

A Status Survey of the Black-buck in Orissa and four local surveys in and around Kolkata were carried out. A survey tour to Gorumara National Park, West Bengal has been conducted in connection with the programme, "Feasibility study for re-introduction of Pygmy Hog", assigned by the Department of Forests, Govt. of West Bengal. 4 new species of cucujoid beetles, 2 new species, one each of the genus Discolaimus (Cobb) (Dorylaimida: Nematoda) and Philolema Cameron (Insecta: Hymenoptera: Eurytomidae) were described. The genus, Barabattoia, along with its species, B. amicorum, and 3 species of hard corals (Favia lacuna, Favites flexuosa and Turbinaria frondens) were recorded for the first time from India (Gulf of Kachchh). Besides, 12 species of hard corals were also recorded for the first time from

the Gulf of Kachchh. 10 species of oribatid mites and 6 species of Protozoa were recorded for the first time from Uttar Pradesh and Maharashtra respectively and 2 species of Protozoa were recorded for the first time from Bor Wildlife Sanctuary, Maharashtra. 2 research papers were published and 4 were accepted for publication. 11 lots of specimens received from various organizations were identified and reports sent. Six samples of imported fur skins of mammals belonging to the Order Carnivora, skins of Leopard, Himalayan Black Bear and Nilgai, a distorted skull of Indian Bison, 5 pieces of antlers of Sambar, an antler of Kashmir Stag, 6 pieces of antlers of Black Buck and a horny coral Corallium sp. were received as seized materials for identification from the Deputy Director, Wildlife Crime Control Bureau (NR), MoEF, Bikaner House, New Delhi, Deputy Commissioner of Police Detective Department, Lalbazar, Kolkata and Office of the Assistant Commissioner of customs, Air cargo complex, Sanganer, Jaipur. The World Environment Day was celebrated on the 5<sup>th</sup>. The occasion was graced by Sri. Abhaya Kumar Padhi, Dy. Director General (ER), Doordarshan Kendra, Kolkata and Prof. Amalendhu Bandhopadyya, Former Director, Positional Astronomy Centre who delivered lectures on "Environment and Media" and "Century's Longest Solar Eclipse", respectively. A checklist on



The hard coral, Barabattoia amicorum, new record to India

Acanthocephala of India, presented in the '*Handbook on Indian Acanthocephala*', published by the Zoological Survey of India, is hyperlinked with the departmental website, www.zsi.gov.in.

Sri. Jairam Ramesh, Hon'ble Union Minister for Environment and Forests, visited the Headquarters Office of the Zoological Survey of India on 24<sup>th</sup> June, 2009. Four books were released by the Hon'ble Minister on the occasion. He was apprised of the activities of ZSI by its Director.

Dr.Ramakrishna, Director, Zoological Survey of India was awarded the E. P. ODUM Gold Medal by the International Society for Ecological Communication during the society's International Conference held at Hazaribagh, Jharkhand.



Sri. Jairam Ramesh, Hon'ble Union Minister for Environment and Forests releasing books published by ZSI during his visit to ZSI, Kolkata on 24<sup>th</sup> June.



Dr. Ramakrishna, Director, ZSI, receiving the
E. P. ODUM Gold Medal for Ecological Communication
from Prof. Arvind Kumar, Vice chancellor,
Vinoba Bhave University, Jharkhand



# Andaman and Nicobar Regional Station, Port Blair

A field survey was conducted at the Rutland Island of Mahatma Gandhi Marine National Park, to explore the faunal diversity of marine and terrestrial ecosystems. 28 species of corals, 32 species of echinoderms, 25 species of molluscs, 3 species of sponges, 3 species of nudibranchs, 2 species of polychaetes, 15 species of butterflies and 31 species of birds were identified during the survey. 25 species of molluscs collected during the earlier surveys were registered and deposited in National Zoological Collection of the Station. A manuscript entitled 'Coral Reef Ecosystem of Andaman Islands-Remote Sensing and Rapid Site Assessment Survey' has been accepted for publication as an Occasional paper by ZSI. As per the advice of the Joint Secretary to Government of India, Ministry of Environment and Forests, a proposal on 'Implementation of Madrid Action Plan for Great Nicobar Biosphere Reserve (GNBR), Andaman & Nicobar Islands', has been submitted to the Ministry as a capacity of Lead Institution for GNBR. The Station represented the State Level Environmental Council Meeting chaired by Honourable Lieutenant Governor of A & N Islands held at Raj Niwas, Port



Egg mass of nudibranch, laid on a reef

Blair on 17<sup>th</sup>. The data on the faunal diversity of Saddle Peak National Park was submitted to the Divisional Forest Officer, Mayabunder, North Andaman, for the preparation of Management Action Plan, on request. As per the request of the Director, Forest Training School, Port Blair, a lecture on faunal diversity of Andaman & Nicobar Islands was delivered to 24 trainees and faculty members from the Forest Training School, during their visit to the station's museum on 20<sup>th</sup>. Identification report on an amphibian species has been given to Conservator of Forests (WL), Dept. of Environment and Forests, A & N Administration, with the help of an expert from WGFRS/ZSI, Calicut. Information on scheduled and endangered species of Sharks of Indian waters has been provided to a Research Fellow of Madras Veterinary College, Chennai through MBS/ZSI, Chennai.

### Publication:

Madhan Chakkaravarthy, V., R. Periasamay, E.G. Wesely and G. Raja, 2009. A novel approach on production of Amylase enzyme from *Pleurotus ostreatus*. *Bulletin of Environmental Sciences*, 28:169-175.



The Coral - Favia complanata



# Marine Aquarium & Research Centre, Digha

248 live fishes and other ornamental marine fauna were procured for the station's aquarium during the month. The major attractions among these collections were *Siganus vermiculatus* (Vermiculate Spinefoot), *Siganus fuscescens* (Mottled spinefoot), *Carangoides ferdau* (Blue Travelly), *Gymnura japonica* (Japanese Butterfly Ray), *Acanthurus lineatus* (Lined Surgeonfish), *Alectis indicus* (Indian Threadfin) and

the Sea cucumbers. Around 77 examples were also procured for the fresh water aquarium tanks. The freshwater pond in the aquarium building premises was also stocked with 7 colourful Koi carp fish (*Cyprinus carpio*). Field surveys conducted during the month also yielded new site records of four fishes for the first time from Digha and its environs. Advisory services were rendered to visitors from various

colleges and schools as well as visitors from the National Metallurgical Laboratory, Jamashedpur. One research manuscript was submitted to the *Journal of Bombay Natural History Society* after final



Acanthurus lineatus - Lined Surgeonfish



Alectis indicus - Indian Threadfin

revision. A videograph on the orange spotted Grouper fish displayed in the station's aquarium was prepared and the video is hyperlinked with the departmental website, www.zsi.gov.in.



Carangoides ferdau - Blue Travelly



Gymnura japonica - Japanese Butterfly Ray

In this Issue

# High Altitude Zoology Field Station, Solan

An extensive survey was conducted in the high altitude areas of Churdhar Wildlife Sanctuary, Sirmour district, Himachal Pradesh. During the field survey, 52 species of birds and 23 species of butterflies were recorded from the Sanctuary. Representative samples of Amphibia, Pisces and Insects were collected for identification and



The butterfly, Metaporia agathon, at Churdhar WLS



Russet sparrow, Passer rutilans, at Churdhar WLS

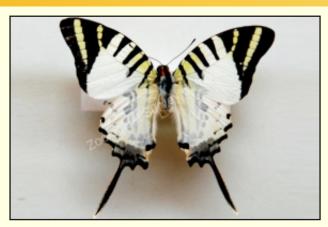
documentation. Besides, the status of various species was evaluated and notes made on their habitats and their behavioural aspects. One species of Pisces, 6 species of Rhopalocera (Lepidoptera) and 3 species of Orthoptera were identified during the month. A paper on micro-Lepidoptera was reviewed for a national journal.

# Gangetic Plains Regional Station, Patna

Four local surveys were undertaken in Patna district, Bihar and 125 specimens of various insect orders were collected for taxonomic study. 13 species of Lepidoptera (Moths and Butterflies) and 6 species of Mollusca were identified from Dalma Wildlife Sanctuary and River Subernarekha respectively, of the Jharkhand state. 4 species of Pteromalidae (Hymenoptera) were identified from Bihar, out of which 1 species turned out to be collected for the first time from the state. One new species of Pteromalidae (Hymenoptera: Insecta) belonging to the genus *Epipteromalus* Ashmead has been described from West Bengal; the genus is reported for the first time from the Old world. A Scientist of the station



Epipteromalus bengalensis (Insecta: Hymenoptera: Pteromalidae) -New species described from W. Bengal



Graphium antiphates pompilius (Lepidoptera: Papilionidae) -New record for Dalma W.L.S. Jharkhand

participated in the scientific study of the skeleton of Bryde's Whale and the collection of the skull bone powder for DNA sequencing, conducted by a team of scientists of the Cetacean Specialist Group. A checklist of Pteromalidae (Insecta: Hymenoptera) from India has been prepared and is hyperlinked with the website of ZSI, www.zsi.gov.in.

### **Publication:**

P. M. Sureshan and S. Talukdar, 2009. First record of *Epipteromalus* Ashmead from the old world with the description of a new species associated with spider egg sacs from India (Hymenoptera: Pteromalidae). *Biosystematica* 3(1): 33-36.

# Freshwater Biological Station, Hyderabad

Two local surveys, one to a hot spring in Andhra Pradesh and the other to a highly polluted lake (Noor Mohammed *Kunta*), on the outskirts of Hyderabad city (Kattedan Industrial Area), receiving effluents from various industrial units around, were undertaken. Follow up taxonomic/ laboratory studies on the fauna of Kolleru Lake were continued with emphasis on amphibians and wetland birds. 4 species of birds observed during the survey were not reported earlier from Kolleru Lake. 44 samples of zooplankton, 26 surface water samples and 1087 examples of various wetland fauna collected from Kolleru Lake were subjected to taxonomic studies, besides identifying 5 species of amphibians.



The Water cock, Galicrex cinerea at Kolleru Lake



# **Arunachal Pradesh Field Station, Itanagar**

A field survey was conducted on 19<sup>th</sup> at the Karsingsa area of Papumpare district of Arunachal Pradesh. 3 species of fishes, 12 species of Orthoptera, 5 species of Lepidoptera, 3 species of Odonata and 3 species of Coleoptera were identified out of the collection. A scientist of the station acted as an expert in the committee which evaluated the draft Rules of Aruanchal Pradesh Biological Diversity Rules - 2009.

In this Issue

# Western Regional Station, Pune

Two research papers were published. Twenty four species of freshwater fishes were identified for a local college and advisory services rendered. Prepared checklists of Ephemeroptera and Odonata of India, and the checklist on Odonata is hyperlinked with the departmental website, www.zsi.gov.in. A scientist of the station attended the training workshop on Records Management for Right to Information Act, at the Institute of Secretariat Training and Management, New Delhi. A scientist of station got selected to participate in the "IUCN Eastern Himalayas Freshwater Biodiversity Assessment Training Workshop" to be held at Kathmandu, Nepal.

### **Publications:**

- 1). Talmale, S. S. and Pradhan, M. S. 2009. Identification of some small mammal species through owl pellet analysis. *Rec. Zool. surv. India. Occasional Paper*, No. 294: 1-44 (Published by Zool. Surv. India, Kolkata).
- 2). Patil, Indira, Yadav, B. E., Jadhav, S. S. and Muley, D. V. 2009. Occurrence of a rare cyprinid fish *Osteocheilus* (*Osteochilichthys*) *nashi* in Pauna River, Maharashtra. *Bionotes*, 11 (2): 53.

In this Issue

# Sunderban Field Research Station, Canning

21 species of fishes and 2 species of brachyuran crabs were identified and registered. Computerisation of data on the registered specimens (102 species from 2011 examples) and identification of the crustacean (crabs) specimens procured during the 3 seasonal surveys (Pre-Monsoon, Monsoon and Post-Monsoon periods) of Sundarban were continued.

In this Issue

# Northern Regional Station, Dehra Dun

The World Environment Day was observed on the  $5^{\text{th}}$ , by planting trees in the campus of the Station and delivering a lecture on Global Warming. The Type depository of the station was further enriched by adding 2 holotypes and 2 paratypes of Protozoan parasites, on receipt from the Rohilkhand University, Bareilly, U.P. Four intensive surveys were undertaken-two in Kalesar National Park (KNP) for sampling the fauna of the Park, one in and around Dehra Dun for the collection of Helminth Parasites of Vertebrates of Doon Valley and another around Ganges in Haridwar for the ecological studies of fresh water turtles. 21 species of butterflies and 2 species of reptiles have been identified from KNP, apart from recording 48 species of birds during the survey. Two research papers referred by an outside journal for review were offered suitable comments. A research paper on the medical and economic importance of Centipedes was submitted for publication in the journal, Annals of Forestry. First proof of the manuscripts on Aves, Reptiles, Nematodes and Butterflies of Uttarakhand (submitted earlier for publication), received for proof reading / updating work was taken care of by the concerned scientists of the station.



Staff planting tree in the office campus on the World Environment day

In this Issue

# Central Regional Station, Jabalpur

A general faunistic survey of Veerangana Durgavati Wildlife Sanctuary, Damoh was undertaken from 18th to 27<sup>th</sup> and 953 specimens belonging to 16 groups of animals were collected. During the month, 8 species of Rotifera, 5 species of Cladocera and 32 species of fishes were identified. A butterfly collection received from the Western Regional Station, Pune was identified and report submitted. Information on dung beetles of India was provided to the Kurukshetra University, on request. A lecture on 'Insect Biodiversity in India' was delivered at the Biosciences Department, Rani Durgavati Vishvavidyalaya, Jabalpur on 11th. A daily newspaper 'Nai Duniya' was given information on threatened butterflies during the observation of the 'Butterfly Day' on 19th. A research paper on the Butterflies of Bhimashankar Wildlife Sanctuary, Maharashtra was submitted for the departmental serial publication, Fauna of Conservation Areas and manuscripts on Ephemeroptera, Plecoptera, Mantodea, Embioptera, Siphonaptera, Trichoptera, Diptera (Tabanidae and Cecidomyiidae) were submitted to the department for the document on the 'Fauna of Karnataka State'.



A tetragnathid spider, Leucage decorata



An oxyopid spider, Peucetia sp., feeding on an insect



# Southern Regional Station, Chennai

3 Scientists of the station delivered lectures in the summer training programme on Biological Sciences for post graduate students, hosted by the Madras University on 4th at Chennai. A senior scientist of the station represented the Director/ZSI in the 17th meeting of the committee on environmental impact issues of the Sethusamudram Shipping Canal Project on 27<sup>th</sup> at Chennai and attended the quarterly meeting of the Trustees of Madras Snake Park at Chennai. Six manuscripts received from scientists of ZSI have been edited for the publication, 'Fauna of Karnataka'. 11 manuscripts received from the Journal of Threatened Taxa were peer-reviewed by a scientist of the station. A scientist participated in the training programme on Right to Information Act-2005, at the Institute of Secretariat Training and Management, New Delhi from 22<sup>nd</sup> to 25. A videograph prepared at the station on Rotifera is hyperlinked with the departmental website, www.zsi.gov.in. 

In this Issue

# Estuarine Biological Station, Gopalpur-on-Sea

6 species of fishes and 3 species of crabs were identified out of the material collected from the Nuanai estuary, Orissa. Besides, 5 species of fishes collected from the Kaveri Estuary, Tamilnadu, were also identified. Data on 250 estuarine fauna deposited in the station's holdings have been entered in the computerised database.

### **Publication:**

D.V. Rao. 2009. Checklist of Fishes of Andaman & Nicobar Islands, Bay of Bengal. *Environment and Ecology*, 27(1A):334-353.

# Eastern Regional Station, Shillong

A faunistic survey tour was conducted in the Nokrek Biosphere Reserve, Meghalaya from 22<sup>nd</sup>-26<sup>th</sup>. Another field survey was conducted at Deepor beel (a Ramsar site), Kamrup district, Assam on 26<sup>th</sup> & 27<sup>th</sup> and water samples as well as qualitative and quantitative plankton samples were collected from six sampling sites. 6 species of Rotifera and 6 species of Cladocera from Deepor beel were identified and registered. 3 species of Rotifera, 4 species of Cladocera and 34 species of Lepidoptera from Nokrek Biosphere Reserve, Garo Hills, Meghalaya were also identified and registered. The Station observed the World Environment Day on 5th and organized a seminar on the topic, 'Role of media in Conservation of Biological Diversity'. Ms. Ampareen Lyngdoh, Minister for Higher & Technical Education, Government of Meghalaya was the Chief Guest and Prof. B. Kharbuli, Dept. of Zoology, North Eastern Hill University, Shillong acted as the



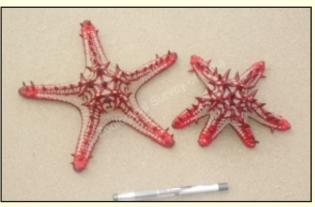
Ms. M. Ampareen Lyngdoh, Minister for Higher & Technical Education, Govt. of Meghalaya speaking on the World Environment Day

chairman during the seminar. Eminent personalities from the print media also spoke on the occasion. The seminar was attended by students and teachers from the various schools and colleges in Shillong.



### Marine Biological Station, Chennai

691 specimens of 7 faunal groups collected during the survey at Gulf of Mannar Biosphere Reserve in the previous month were sorted out and 5 species of sponges and 11 species of marine fishes were identified. Further, 10 species of fishes from Southern Eastern Ghats were identified and registered. 2 identification services were rendered. 385 tourists visited the marine aquarium, maintained at the station, during the month. A senior scientist of the station delivered an invited lecture at the Summer Training Programme for M.Sc students of the University of Madras on Biological Sciences, organized by Science City, Govt. of Tamil Nadu, on



The starfish, *Protoreaster lincki*, with abnormal number of arms (specimen on the right side)



The starfish, *Pentaceraster mammillatus*, with abnormal number of arms

4<sup>th</sup> in the Anna University Campus, Chennai and participated in the Interactive Meeting of the Quinquennial Review Team at the Central Institute of Brackishwater Aquaculture, ICAR, Chennai, on 27<sup>th</sup>. A research paper on the bird, Glossy Ibis has been published and another paper on the Cochinbanded Sea snake, *Hydrophis ornatus ornatus* (Gray) has been accepted for publication.

### Publication:

Venkatraman, C. 2009. Breeding of Glossy Ibis *Plegadis falcinellus* at Vedanthangal Waterbird Sanctuary, Southern India. *Indian Birds*, 5 (1): 18-19.



# **Desert Regional Station, Jodhpur**

Two research papers were published. 7 species of Odonata, 3 species of Coleoptera 2 species of Orthoptera and 4 species of Nematoda were identified during the month. On the World Environment Day, 15 seedlings were planted in the campus and Dr P. J. Parmar, Jt. Director, Botanical Survey of India, Jodhpur delivered a lecture during the occasion. A scientist of the station got selected to participate in the "IUCN Eastern Himalayas Freshwater Biodiversity Assessment Training Workshop" to be held at Kathmandu, Nepal. Another scientist of the station delivered a lecture on identification of poisonous and non-poisonous snakes to the 10<sup>th</sup> Battalion of Parachute Regiment (Special Force) of the Indian Army on 25th. The library database of the station was updated incorporating 18 additional entries, employing the software e-granthalaya. 378



Crocodylus palustris at Mount Abu Wildlife Sanctuary, Rajasthan

entries of identified fauna were made in the faunal database maintained at the station. The museum at the station had 11 visitors during the month. Advisory services were rendered on classification of fauna, on request from a Rajasthan Administrative Service candidate.

### **Publications:**

- 1). Sharma, G., Joshi, P.C., Kumar, R. and Vasu, D. 2009. Floral diversity and limnological studies in and around Dholbaha dam (Punjab Shivalik, India). Biological Forum-An International Journal. 1(1): 22-31.
- 2). Kumar, R., Sharma, G., Kumar, N. and Ramamurthy, V.V. 2009. Taxonomic studies on vegetable pests of Family Pieridae (Lepidoptera) form North India. Biological Forum-An International Journal. 1(1): 89-97.



The Butterfly, Hypolimnas misippus, at Bheel Beri Sanctuary, Rajasthan In this Issue

# Western Ghats Field Research Station, Kozhikode (Calicut)

A manuscript entitled "An annotated checklist of Amphibia of India with some insights into the patterns of species discoveries, distribution and endemism", and a paper describing a new species of Diapriidae (Proctotrupoidea: Hymenoptera) have been submitted for publication in the Records of Zoological Survey of India. 13 species of Odonata were identified out of the collections received from the Northern Regional Station, ZSI, Dehradun. 3 species of the Genus Paramesius Westwood (Diapriidae: Hymenoptera), received from the British Musuem of Natural History (London), were identified. 2 research papers were reviewed and advisory service rendered. Identification service was rendered to the

Wildlife Crime Control Bureau, Regional Office, Kochi on antlers and wildlife trophies, confiscated at the Cochin Port. One of the staff visited the Molecular Biology and Amphibian Laboratory of the Delhi University from 15th to 17th, and officiated as an external examiner for a viva-voce examination in the Centre for Environmental Management of Degraded Ecosystems (CEMDE) of the university. In connection with the World Environmental Day celebrations, a lecture on Biodiversity of Mangroves in Kerala was delivered at the Chinamaya Mission Higher Secondary School, Calicut on 5th and a talk on the "Faunal diversity of the proposed Malabar Wildlife Sanctuary and its environs" was delivered in a

seminar organized by the state forest department at Calicut on 12<sup>th</sup>. 99 visitors paid their visits to the museum at the station, during the month. A scientist of the station got selected to participate in the "IUCN Eastern Himalayas Freshwater Biodiversity Assessment Training Workshop" to be held at Kathmandu, Nepal.

A videograph of the freshwater medusa, *Limnocnida* indica Annandale, recorded during the survey at the Bhadra Wildlife Sanctuary, Karnataka, is hyperlinked with the departmental website, www.zsi.gov.in.

### Two Endemic Amphibians of Western Ghats







Philautus luteolus



### **ANIMAL OF THE MONTH**



The Pink-headed Duck Rhodonessa caryophyllacea (Latham)

The Pink-headed Duck (*Rhodonessa caryophyllacea*) of the bird Family, Anatidae is a large diving duck that was once found in parts of the Gangetic plains of India, Bangladesh and in the riverine swamps of Myanmar. Sidney Dillon Ripley considered it as 'likely to be extinct' in 1950, since this species has not been conclusively seen in the wild after 1949. It was always considered rare, and is likely to have declined through a combination of hunting pressures and habitat loss. However, there were credible local

reports from some remote wetland areas of northern Myanmar regarding its occurrence, in 2006. Yet, searches made in northern Kachin State of Myanmar, focusing on the three sites from where there had been reports or claims, failed to find convincing evidence of the continued existence of the species there. If at all remaining, the population is likely to be tiny, and for that reason the species is treated as 'Critically Endangered'.

The Pink-headed Duck has been reported to be a shy



Preserved specimens and eggs of the Pink-headed duck in the faunal depository of ZSI, Kolkata

and secretive bird, preferring secluded and overgrown still-water pools, marshes and swamps in lowland forests and tall grasslands, particularly in areas subjected to seasonal inundation by rain water. In the non-breeding season, it used to be encountered in small groups and occasionally in flocks of 30-40. Some, and possibly all, populations undertook local seasonal movements, resulting in scattered historical records from Punjab, Maharashtra and Andhra Pradesh in India.

Collected between 1825 and 1936, there are about 80 skins of the bird in various museums of the world. In India, the Zoological Survey of India, Kolkata and the Bombay Natural History Society, Mumbai have a few specimens of the species.

#### References:

- 1. Kumar, A., Sati, J.P., and Tak, P.C and Alfred, J.R.B. 2005. *Handbook on Indian Wetland Birds and their Conservation*: i-xxvi; 1-468 (Published by the Director, Zoological Survey of India)
- 2. http://www.birdlife.org/datazone/species/index.html?action=SpcHTMDetails.asp&sid=468
- 3. http://www.iucnredlist.org/details/141536/0.

